

## **Electronics Reuse and Recycling at Brookhaven National Laboratory, Keith Klaus, Donna King, and Kathy Gurski**

Used and obsolete electronics, such as computers, are part of a huge and complex waste stream that poses challenging environmental management problems. Electronic products contain a variety of hazardous constituents such as lead and cadmium. This ever increasing and changing waste stream presents challenges and responsibilities in end-of-life management. At Brookhaven National Laboratory (BNL) several mechanisms are utilized in order to responsibly manage electronics at the end of their useful life.

Consistent with the EPA hierarchy for waste reduction, BNL conducts its reuse/recycling operations with a focus on source reduction (reuse). Several mechanisms are in place to facilitate reuse of electronic equipment.

### **Reuse**

BNL utilizes many programs for reuse of electronic equipment. The Laboratory itself is its greatest resource for reutilization. Annual transfers between various departments and divisions number range from 500 to 2,000 units. A great number of BNL's electronic assets are transferred from user to user until such time as an item reaches or exceeds its life expectancy and is either too old or no longer working or repairable. The average life of electronic equipment is greater than 5 years before being retired. If assets are turned into Property Management in good condition, one of the following takes place:

- 1) Item is placed in BNL pool for internal reuse.
- 2) ADPE (Automated Data Processing Equipment) is offered to the Computers for Learning (CFL) Program. BNL donated over 20 computers systems and printers to local schools through the CFL program during 2006.
- 3) Items are entered into the EADS/GSAXcess excess database for screening throughout the country. The screening process is as follows:
  - 15 days for DOE only screening
  - After DOE screening if items are coded laboratory equipment, they are then automatically feed into the Energy Related Laboratory Equipment Program (ERLE) where they are offered to Universities for a 30 day period. (Universities must be registered to be part of this program). Transfers facilitated through this program must be approved through the area Operational Property Management Officer (OPMO).
  - If assets are not claimed after DOE or ERLE screening, the items are then feed into the GSAXcess program for screening by other federal agencies for a 21 day period. During the last four days of this period, state and local governments can screen equipment, but cannot freeze items until the 21 day period is complete.



*Computer servers recently screened on the GSA reuse site, currently being held for sale.*

If items are not taken through the excess program, they are returned to BNL Property Management for disposition. The items are then offered for sale via internet through the Bid4assets program which is an ICPT contract.

If equipment is returned to Property Management in non-working condition, the working components such as memory, hard drives, video cards, sound cards, and CD/DVD drives are removed and retained for reuse on site by BNL staff.



*Components for reuse*

## **Computers for Learning and Educational Component**

BNL's Electronics recycling program has both an internal and external educational component.

Internally, the reuse and recycling components are communicated in a variety of methods. Articles are published in the "Monday Memo", a biweekly email memo from the Laboratory Director to employees to communicate programs such as the Federal Electronics Challenge and the Federal Electronics Reuse and Recycling Campaign. Similar articles are published in "the Bulletin", the weekly Laboratory newspaper. Other publications include "Compliance Corner" which is distributed to waste generators; and the ESH&Q monthly newsletter which is distributed to staff with ESH&Q responsibilities. Presentations focused on electronics recycling have been given to building managers and also to Environmental Management Systems (EMS) representatives. BNL has an active website for electronics recycling, <http://www.bnl.gov/esd/pollutionpreve/electronics/default.asp>

BNL recently received a DOE award for participating in the FERRC, the Award was publicized in "the Bulletin", newsletters and on the recycling website.

Externally, the Community Educational Governmental Affairs (CEGPA) Office of Educational Programs (OEP) is responsible for executing the CFL program, and is responsible for communications to the public. The CFL program through its outreach activities has donated over 20 computer systems to two different needy schools in 2006 and anticipates building a wider network of schools for the donation of electronic equipment.



*BNL donated excess computer equipment to the Kid's Place Early Childhood Day School, for the purpose of improving the math and science education curricula. (March 23, 2006)*



*Computers segregated for Computers for Learning educational gifting program*

## Recycling

Consistent with the EPA Waste Hierarchy, electronic equipment is sent out for recycling only as a last resort. All assets that are turned in to Property Management in scrap condition are sent to a contracted scrap dealer for recycling. BNL has recently shipped electronic equipment to UNICOR for recycling; plans to continue utilizing UNICOR exclusively are currently being evaluated. BNL recycled over 69,000 pounds of electronic equipment during the 2006 Federal Electronics Reuse and Recycling Challenge. BNL recycled over 123,000 pounds of electronic equipment in 2006.



*Computers prepared for recycling, ready to be shipped*